Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Savannah River**

Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site**

HQ ID: **0039**

Project **SR-HL04 / Waste Pretreatment**

General Project Information

Project Description Narratives

Purpose, Scope, and Technical Approach:

THE SCOPE OF WORK DESCRIBED IN THIS PROJECT IS WRITTEN FOR FUNDING AT THE PLANNING LEVEL. (NOTE: The title of this PBS will be changed to Waste Pretreatment.) Waste Pretreatment involves operation of the Extended Sludge Process (ESP); pre-staging of feed for the Vitrification and Salt Processing Facilities; and storage of waste in six high-level waste storage tanks (each having a volume of approximately 1.3 million gallons). ESP receives high-level, liquid sludge waste that has been removed from H and F Tank Farm waste storage tanks; pre-treats it to remove excess amounts of soluble salts and non-radioactive aluminum; and then sends it to DWPF for vitrification. Pretreatment reduces the volume of waste to be vitrified and ensures that the vitrified waste meets waste acceptance criteria. ESP is also responsible for the safe storage of the sludge being processed and fed to Vitrification (approximately two million gallons and 10 million curies of liquid high-level radioactive waste). Pretreatment activities include 24-hour surveillance, maintenance, monitoring, inspection, and sampling of six HLW tanks (each with systems for leak detection, liquid level monitoring, ventilation, combustible gas monitoring, temperature monitoring and cooling, and remote inspection); chemical additions; sludge washing; and multiple waste transfers (between tanks, to/from H-Tank Farm, and to DWPF. Work is done remotely or with shielding due to the intense radiation fields. (NOTE: The In-Tank Precipitation (ITP) and Late Wash facilities are no longer planned to be operating facilities. Scope for an Salt Processing Facility is now covered by Project SR-HL13.)

Technical Approach: The key technologies used in the safe storage and pretreatment of this liquid high level radioactive wasteare:
- Chemical dissolution
- Tank mixing
- Solids settling

Project Status in FY 2006:

In FY06 the ESP facilities for performing aluminum dissolution in Tanks 40 and 51 and for feeding DWPF from each tank will be complete. Sludge will have been processed by ESP and vitrified by DWPF into 2,100 canisters (which is 37% of the estimated 5,700 total cans to be filled). Tank 42, which had previously contained sludge, will be cleaned out for use in waste storage. Tanks 49 and Tank 50 will have been modified and placed into waste storage usage. The ITP and Late Wash facilities will have been placed in cold standby, with disposition deferred until FY15 to make available any part of these facilities for possible reuse by the Salt Processing Facility (SR-HL13).

Post-2006 Project Scope:

By the end of FY26, all remaining sludge, including sludge from ongoing operations, will have been processed by ESP and vitrified by DWPF into an estimated 5,700 total canisters, completing the high-level waste removal and vitrification program at SRS.

Late Wash - the facility will have been replaced by the new salt processing facility

Project End State

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Project Description Narratives

Waste Pretreatment operations will end in FY26 when all legacy, as well as currently projected sludge waste from ongoing operations, will have been processed and vitrified at DWPF. Operational closure activities (e.g., waste heel removal, water washing, physical isolation and filling with grout) are covered by Waste Removal and Tank Closure (SR-HL03) and disposition is covered by High Level Waste Facilities Disposition (SR-FA24).

Cost Baseline Comments:

Outyear estimates use FY01 as the base year, adding escalation and adjusting for the following major programmatic changes. There are no major programmatic changes until FY22 when ESP pretreatment operations are completed. Operating costs are reduced by 50% for FY23 since the only continuing activities will be sludge feeding and storage activities. All operating costs end in FY26 when the final feed is transferred to DWPF for vitrification. Operational closure of tanks and support facilities are covered in SR-HL03 and disposition is covered in SR-FA24.

Safety & Health Hazards:

The main hazard in this facility is from the highly radioactive liquid waste (2 million gallons, 10 million Ci). The main radioactive constituents of this waste are Strontium-90, Cesium-137, Plutonium-238, Plutonium-239, and Plutonium-241. The tanks were built underground to provide shielding from the intense radiation fields of this highly toxic waste. Operations, maintenance and waste handling and done under radiological conditions to avoid direct personnel exposure and prevent contamination. Other hazards include exposure to process chemicals & byproducts (such as nitric acid, sodium hydroxide, and benzene) as well as miscellaneous hazards commonly encountered in industrial settings (lifting, tripping, falls, rotating equipment, etc.). These hazards are controlled both through engineering controls (hand rails, motor guards, etc.) and through administrative controls (policies and procedures, training, personal protective equipment, etc.).

Safety & Health Work Performance:

All work is performed using a WSRC Integrated Safety Management System (ISMS) approach. The ISMS integrates safety considerations into management and work practices at all levels to accomplish missions while protecting the public, the worker, and the environment. The key elements of the WSRC ISMS are to define the scope of work, identify and analyze hazards associated with the work, develop and implement hazard controls, perform work within controls, and provide feedback on adequacy of controls and continue to improve safety management. The WSRC Integrated Procedures Management System is the primary mechanism for implementing the objective, principles and functions of the ISMS. This system establishes Company-Level, Division-level, and Program-specific procedures consistent with organizational roles, and ensures a consistent, disciplined site-wide approach to safety while performing work.

PBS Comments:

Funding for ITP, ESP and Late Wash is at the level necessary to assure continued feed to DWPF to meet an overall system production of 200 canisters per year from FY98-04, 225 canisters in FY05, and 200-250 canisters per year from FY06-end of program.

ITP/ESP operates under a SCDHEC waste water permit.

The major Regulatory drivers for this project are:
Federal Facilities Agreement - Executed by the Department of Energy, the Environmental Protection Agency and the South Carolina Department of Health and Environmental Control on January 15, 1993. The initial schedule proposed that liquid high level radioactive waste be removed all 24 of

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Project Description Narratives

the old style tanks in H and F-Tank Farms which do not meet specified secondary containment and leak detection requirements by 2028. This proposed date, however, has been rejected by the state as not aggressive enough. Negotiations are underway to establish a more aggressive commitment date that will meet regulatory expectations while balancing technical and resource limitations.
Site Treatment Plan - The Site Treatment Plan for SRS includes the following commitments for DWPF (Vitrification, SR-HL05): "After the startup period is complete and DWPF begins full operation, the maintenance of an average of 200 canisters of processed glass per year will be required in order to meet the schedule for removal of backlogged and currently generated waste inventory by the year 2028." This requires ITP/ESP to be funded at the level necessary to maintain feed to DWPF at the required rate.

Baseline Validation Narrative:

This project has completed an internal validation conducted by SRS personnel independent from the project.

General PBS Information

Project Validated? Yes **Date Validated:** 1/29/1999

Has Headquarters reviewed and approved project? No

Date Project was Added: 12/1/1997

Baseline Submission Date: 7/3/1999

FEDPLAN Project? Yes

Drivers:

CERCLA	RCRA	DNFSB	AEA	UMTRCA	State	DOE Orders	Other
N	N	N	N	N	Y	N	N

Project Identification Information

DOE Project Manager: H. B. Gnann

DOE Project Manager Phone Number: 803-208-6076

DOE Project Manager Fax Number: 803-208-7414

DOE Project Manager e-mail address: howard.gnann@srs.gov

Is this a High Visibility Project (Y/N): Y

Planning Section

Baseline Costs (in thousands of dollars)

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Project **SR-HL04 / Waste Pretreatment**

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006
PBS Baseline (current year dollars)	639,215	1,524,934	2,164,149	87,259	87,259	75,738	75,738	57,379	55,364	55,553	58,347	59,923	61,541	63,202	64,909
PBS Baseline (constant 1999 dollars)	590,243	950,355	1,540,598	87,259	87,259	75,738	75,738	57,379	53,440	51,759	52,933	52,934	52,934	52,933	52,934
PBS EM Baseline (current year dollars)	639,215	1,524,934	2,164,149	87,259	87,259	75,738	75,738	57,379	55,364	55,553	58,347	59,923	61,541	63,202	64,909
PBS EM Baseline (constant 1999 dollars)	590,243	950,355	1,540,598	87,259	87,259	75,738	75,738	57,379	53,440	51,759	52,933	52,934	52,934	52,933	52,934

	2007	2008	2009	2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
PBS Baseline (current year dollars)	66,661	68,461	70,310	72,208	391,358	447,122	353,520	55,294	0	0	0	0	0	0	0	0
PBS Baseline (constant 1999 dollars)	52,933	52,934	52,934	52,934	265,044	265,042	183,423	25,111	0	0	0	0	0	0	0	0
PBS EM Baseline (current year dollars)	66,661	68,461	70,310	72,208	391,358	447,122	353,520	55,294	0	0	0	0	0	0	0	0
PBS EM Baseline (constant 1999 dollars)	52,933	52,934	52,934	52,934	265,044	265,042	183,423	25,111	0	0	0	0	0	0	0	0

Baseline Escalation Rates

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.00%	0.00%	0.00%	3.60%	3.60%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%

2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070

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Project **SR-HL04 / Waste Pretreatment**

2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%

Project Reconciliation

Project Completion Date Changes:

Previously Projected End Date of Project: 9/1/2024

Current Projected End Date of Project: 9/1/2026

Explanation of Project Completion Date Difference (if applicable):

Due to funding constraints in FY00 - FY06, this project completion will be delayed by two years.

Project Cost Estimates (in thousands of dollars)

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars):	2,543,942	**Actual 1997 Cost:**	87,259	**Actual 1998 Cost:**	75,738
Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars):	2,380,945	**Inflation Adjustment (2.7% to convert 1998 to 1999 dollars):**			64,286
Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	2,445,231				

Project Cost Changes

	Cost Adjustments	Reconciliation Narratives
Cost Change Due to Scope Deletions (-):	1,133,697	ITP/LW - not operational. Salt Processing included in PBS SR-HL13.
Cost Reductions Due to Efficiencies (-):		
Cost Associated with New Scope (+):		
Cost Growth Associated with Scope Previously Reported (+):	66,068	Funding limits in FY00-06 results in 2 years of additional storage cost.
Cost Reductions Due to Science & Technology Efficiencies (-):		
Subtotal:	1,377,602	
Additional Amount to Reconcile (+):	-1	
Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	**1,377,601**	

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Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
NOT A MILESTONE			9/30/1998								
Last Material Fed to Vitrification Facility	SR-HL04-260		3/30/2026								
Project Complete	SR-HL04-261		9/1/2026								
NOT A MILESTONE			9/30/1998								
NOT A MILESTONE			9/30/1998								
Project Start	SR-HL04-001		10/10/1996								

Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critial Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
NOT A MILESTONE										Y	
Last Material Fed to Vitrification Facility	SR-HL04-260										
Project Complete	SR-HL04-261				Y						
NOT A MILESTONE										Y	
NOT A MILESTONE										Y	
Project Start	SR-HL04-001			Y							

Performance Measure Metrics

Category/Subcategory	Units	1997-2006 Total	2007-2070 Total	1997-2070 Total	Actual Pre-1997	Planned 1997	Actual 1997	Planned 1998	Planned 1999	Planned 2000	Planned 2001	Planned 2002	Planned 2003	Planne 200
HLW														
Storage	M3							5,976.00	5,252.00	6,874.00	6,293.00	5,711.00	7,813.00	7,138.(

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Performance Measure Metrics

Category/Subcategory	Units	1997-2006 Total	2007-2070 Total	1997-2070 Total	Actual Pre-1997	Planned 1997	Actual 1997	Planned 1998	Planned 1999	Planned 2000	Planned 2001	Planned 2002	Planned 2003	Planne 20(
Tech.														
Deployed	Ntd	1.00	0.00	1.00						1.00				

Category/Subcategory	Units	Planned 2004	Planned 2005	Planned 2006	Planned 2007	Planned 2008	Planned 2009	Planned 2010	Planned 2011 - 2015	Planned 2016 - 2020	Planned 2021 - 2025	Planned 2026 - 2030	Planned 2031 - 2035
HLW													
Storage	M3	7,138.00	6,275.00	7,903.00	7,032.00	6,134.00	7,689.00	6,773.00	8,011.00	5,307.00	0.00	0.00	
Tech.													
Deployed	Ntd												

Category/Subcategory	Units	Planned 2036 - 2040	Planned 2041 - 2045	Planned 2046 - 2050	Planned 2051 - 2055	Planned 2056 - 2060	Planned 2061 - 2035	Planned 2066 - 2070	Exceptions	Lifecycle Total
HLW										
Storage	M3									
Tech.										
Deployed	Ntd									1.00

Technology Needs

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Technology Needs

Site Need Code: SR99-2034
Site Need Name: Second Generation Salt Feed Preparation
Focus Area Work Package ID: TFA-3
Focus Area Work Package: Alternative Paths to In-Tank Precipitation at SRS
Focus Area: TFA
Agree with Technology Link: N
Benefits (Cost, Risk Reduction, Both): Risk Reduction

Technologies	Cost Savings (in thousands of dollars)	Range of Estimate

Site Need Code: SR99-2039
Site Need Name: Methods to Unplug Waste Transfer Lines
Focus Area Work Package ID: WT-08-01
Focus Area Work Package: Solids Pretreatment
Focus Area: TFA
Agree with Technology Link: Y
Benefits (Cost, Risk Reduction, Both): Risk Reduction

Technologies	Cost Savings (in thousands of dollars)	Range of Estimate

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Technology Needs

Site Need Code: SR99-2044

Site Need Name: Demonstrate In-Situ Characterization Weight Percent Probe

Focus Area Work Package ID: WT-08-01

Focus Area Work Package: Solids Pretreatment

Focus Area: TFA

Agree with Technology Link: Y

Benefits (Cost, Risk Reduction, Both): Risk Reduction

Technologies	Cost Savings (in thousands of dollars)	Range of Estimate

Technology Deployments

	Deployment Year		
Deployment Status	**Planned**	**Forecast**	**Actual Date**
Technology Name: Weight Percent Probe			
Potential Deployment	2000		